Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-8 were canceled.

(Previously Added) 9. A method for removal of contaminants in a soil formation comprises:

supplying ambient air and ozone at concentrations to effect removal of the contaminants;

producing microbubbles containing the ambient air and ozone at concentrations to effect removal of contaminants; and

introducing the microbubbles containing the ambient air and ozone at concentrations to effect removal of contaminants into the soil formation under conditions that contaminants in a dissolved state in the soil formation are pulled out of the soil formation through the microbubbles and are provided in a vapor state within the microbubbles to react with the ozone contained in the microbubbles in accordance with Henry's law.

(Previously Added) 10. The method of claim 9 wherein the microbubbles are sized in accordance with a porosity characteristic of the soil formation.

(Previously Added) 11. The method of claim 9 wherein introducing further comprises:

providing a plurality of injection wells to introduce the microbubbles containing the ambient air and ozone.

(Previously Added) 12. The method of claim 11 wherein introducing further comprises:

using a plurality of microporous diffusers in the plurality of injection wells to introduce

the microbubbles containing the ambient air and ozone.

(Previously Amended) 13. The method of claim 9 wherein the soil formation has contaminants, and with the contaminants having a Henry's constant in the order of about 2.59 x 10^{-2} to 4.48 x 10^{-5}.

(Previously Added) 14. The method of claim 9 wherein contaminants in the soil formation are decomposed by ozone interaction in the bubbles with the contaminants.

(Previously Added) 15. The method of claim 9 wherein the fine bubbles have an initial bubble size at least between about 5 to 200 microns.

(Previously Added) 16. A method for removal of contaminants in a soil formation comprises:

providing a plurality of injection wells and introducing ambient air and ozone as microbubbles through the injection wells by using a corresponding micro-porous diffuser for each one of the plurality of injection wells;

surrounding the micro-porous diffusers with a sand pack disposed between the micro-porous diffusers and the surrounding soil formation; and

introducing ambient air and ozone as microbubbles by using micro-porous diffusers in the injection wells under conditions that moist soils promote contaminants that exist in a dissolved state in the soil formation to be pulled out of the soil formation through membranes of the microbubbles and react in a vapor state within the microbubbles with the ozone contained in the microbubbles.

(Previously Added) 17. The method of claim 16 wherein the microbubbles increase the lifetime of ozone in the soil formation.

(Previously Added) 18. The method of claim 16 wherein removal of contaminants can occur without a vapor extraction.

(Previously Added) 19. The method of claim 16 further comprising pulsing a water phase to provide steady upward migration of the micro-fine bubbles through the soil formation.

(Previously Added) 20. The method of claim 16 wherein the soil formation contains chlorinated hydrocarbons.

(Previously Added) 21. The method of claim 16 wherein the soil formation contains chlorinated ethenes.

(Previously Added) 22. The method of claim 16 wherein the contaminants include chlorinated ethenes including dichloroethene, trichloroethene, and/or tetrachloroethene.

(Previously Added) 23. The method of claim 16 wherein the micro-porous diffusers have a pore size between about 5 to 200 microns to provide the fine bubbles.

(Previously Added) 24. The method of claim 16 wherein the micro-porous diffusers have a pore size selected to match a porosity characteristic of the surrounding soil formation.

(Previously Added) 25. The method of claim 16 wherein the micro-porous diffusers have a pore size selected to match a porosity characteristic and a permeability characteristic of the surrounding soil formation.

(Previously Added) 26. A process for removing contaminants, said process comprising:

injecting gas including an oxidizing gas into a site, the gas injected as bubbles that travel through a soil formation in the site, the bubbles having an initial bubble diameter in a range of about 5 to 200 microns, the bubbles promoting pulling of contaminants into the bubbles and to decompose the contaminants in a reaction with the gas in the bubbles in the presence of water.

(Previously Added) 27. The process of claim 26 further comprising:

enhancing decomposition of the contaminants by carrying out the reaction in the presence of a reaction promoter.

(Previously Added) 28. The process of claim 26 wherein the bubbles of oxidizing gas include oxygen and ozone.

(Previously Added) 29. The process of claim 26 wherein the bubbles are produced by using a microporous diffuser that has a porosity characteristic matched to soil conditions on the site and fluid acceptance range to avoid fracturing of the substrate structure.

(Previously Added) 30. The process of claim 26 wherein the bubbles of oxidizing gas include ozone, and the bubbles extract volatile dissolved tetrachloroethene, trichloroethene, and/or dichloroethene while ozone in the bubbles decomposes the tetrachloroethene, trichloroethene, and/or dichloroethene.

(Previously Added) 31. The process of claim 26 wherein contaminants are dissolved chlorinated hydrocarbons and/or dissolved hydrocarbon products.

(Previously Added) 32. The process of claim 26 wherein the bubbles contain a mixture of air and ozone to decompose the contaminants; further comprising varying respective concentrations of oxygen and ozone to effect the rate of decomposition.

(Previously Added) 33. The process of claim 26 wherein injecting occurs by delivering the gas under pressure through a microporous diffuser device that is disposed into the site.

(Previously Added) 34. The process of claim 26 wherein injecting occurs by delivering the gas under pressure through a microporous diffuser device that is disposed in a well that is provided in the site.

(Previously Added) 35. The process of claim 26 wherein injecting occurs by delivering the gas under pressure through a microporous diffuser device that is injected into the site.

(Previously Added) 36. The process of claim 26 wherein injecting occurs by delivering the gas under pressure through a microporous diffuser device that is disposed into an underground aquifer that is under the site.

Please add new claims 37-66 as follows:

(New) 37. A method of removal of volatile organic compounds in a soil formation comprises:

injecting air including ozone into the soil formation, the ozone being at concentrations to effect removal of volatile organic compounds, the air including ozone is injected into a sub surface ground water aquifer as fine bubbles with an initial bubble size in a range of about 5 to 200 microns, said fine bubbles traveling through the sub surface ground water aquifer and with the ozone reacting with said volatile organic compounds inside the bubbles.

(New) 38. The method of claim 37 wherein the fine bubbles are sized in accordance with a
porosity characteristic of the soil formation.

(New) 39. The method of claim 37 wherein injecting further comprises:

providing a plurality of injection wells and introducing the ambient air and ozone as fine bubbles between about 5 to 200 microns through the injection wells.

(New) 40. The method of claim 39 further comprising introducing the ambient air and ozone through a second plurality of microporous diffusers disposed in the plurality of injection wells.

(New) 41. The method of claim 37 further comprising periodically pulsing the air including ozone.

(New) 42. The method of claim 37 wherein injecting further comprising:

mixing the ambient air with the ozone.

(New) 43. The method of claim 37 wherein injecting further comprises:

mixing the ambient air with the ozone; and

delivering the ambient air and ozone through a plurality of microporous diffusers to produce the fine bubbles of ambient air and ozone.

(New) 44. The method of claim 37 wherein volatile organic compounds in the soil formation are decomposed by ozone interaction with double bonded carbon atoms of the volatile organic compounds.

(New) 45. The method of claim 37 wherein the fine bubbles have an initial bubble size at least between 50 to 200 microns.

(New) 46. The method of claim 37 wherein the fine bubbles have an initial bubble size at least between 20 to 50 microns.

(New) 47. The method of claim 37 wherein the fine bubbles have an initial bubble size at least between 5 to 20 microns.

(New) 48. The method of claim 37 further comprising:

providing a plurality of injection wells and injecting the ambient air and ozone as fine bubbles through the injection wells by using a corresponding microporous diffuser for each one of the plurality of injection wells;

surrounding the microporous diffusers with a sand pack disposed between the microporous diffusers and the surrounding soil formation.

(New) 49. The method of claim 37 wherein removal of volatile organic compounds can occur without a vapor extraction.

(New) 50. The method of claim 37 further comprising agitating with pumped water to disperse said bubbles through the soil formation.

(New) 51. The method of claim 37 wherein the soil formation contains chlorinated hydrocarbons.

(New) 52. The method of claim 37 wherein the soil formation contains organic and hydrocarbon material.

(New) 53. The method of claim 37 wherein the volatile organic compounds include chlorinated solvents including dichloroethene, trichloroethene, and/or tetrachloroethene.

(New) 54. The method of claim 37 wherein microporous diffusers are used to generate said fine bubbles and the microporous materials of the microporous diffusers have a pore size selected to match a porosity characteristic of the surrounding soil formation.

(New) 55. The method of claim 54 wherein the microporous materials of the microporous diffusers have a pore size selected to match a porosity characteristic and a permeability characteristic of the surrounding soil formation.

(New) 56. The method of claim 37 wherein microporous diffusers are used to generate said fine bubbles and the microporous materials of the microporous diffusers have a pore size selected to match a permeability characteristic of the surrounding soil formation.

(New) 57. The method of claim 37 further comprises:

generating an oxidizing agent comprising the ozone at the concentrations to effect removal of contaminants;

mixing ambient air with ozone to produce the air including the ozone.

(New) 58. Apparatus for injection of a gas into aquifer regions for removal of volatile organic compounds by reaction with ozone comprising:

a gas generator for generating an oxidizing agent comprising ozone for injection of air including ozone into the aquifer;

a casing;

an air injection passageway through the casing and coupled to the gas generator; and

a microporous diffuser coupled to the gas generator, said microporous diffuser including a body having a porous portion with a pore size in the range of about 5-200 microns.

(New) 59. The apparatus of claim 58 further comprising:

an outlet screen coupled to the casing.

(New) 60. The apparatus of claim 59 wherein the casing has an outlet screen at a lower portion of the casing and with the apparatus further comprising:

an inlet screen coupled to the casing at an upper portion of the casing.

(New) 61. The apparatus of claim 58 further comprising:

a compressor coupled to the gas generator to provide the gas to the outlet screen and the microporous diffuser at an elevated pressure.

(New) 62. The apparatus of claim 58 wherein the microporous diffuser is disposed outside of the casing.

(New) 63. The apparatus of claim 58 wherein the microporous diffuser is disposed within the casing.

(New) 64. The apparatus of claim 58 wherein the microporous diffuser is a first microporous diffuser disposed within the casing and wherein the apparatus further comprises:

a second microporous diffuser disposed below the casing.

(New) 65. The apparatus of claim 58 wherein the casing and apparatus is disposed within a well, the well provided on a site having an aquifer, and wherein said apparatus further comprises:

an outlet screen disposed in the aquifer; and

an inlet screen disposed above said outlet screen.

(New) 66. The apparatus of claim 58 further comprising a packer disposed through the casing.